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TOBACCO INDUSTRY RESEARCH COMMITTEE
350 FIFTH AVENUE NEW YORK 1, N. Y.

Extremely broad proposal
Have all of these & unknown components been worked out by experts

Application For Research Grant

Date: November 24, 1954

1. Name of Investigator: Frank D. Pickel, Ph.D.

2. Title: Associate Director of Research

3. Institution & Address: Evans Research & Development Corp.
250 East 43rd Street
New York 17, New York

4. Project or Subject: Chemical Studies of Tobacco, Tobacco Additives, and Cigarette Smoke

a. Isolation and identification of products of controlled combustion of tobacco and of tobacco and of cigarette tobaccos containing the usual additives.

b. Acting as a central source of supply, for medical investigators, of compounds identified in cigarette smoke; preparation by isolation or synthesis.

5. Detailed Plan of Procedure (Use reverse side if additional space is needed):

Smoking is a controlled combustion that initiates a variety of chemical reactions covering the extreme range from no reaction, as shown by the survival of unchanged nicotine, to complete destruction, as shown by the presence of carbon monoxide and carbon dioxide in the main smoke stream. It is a process that simultaneously includes such unit operations as evaporation, sublimation, distillation, steam distillation, and pyrolytic cracking.

Because this process is complex and because the modern cigarette has become complicated by the incorporation of additives (casing materials, humectants, etc.), it is suggested that representative tobacco samples wrapped in pure alpha cellulose be studied first to obtain a basic set of values with which the values obtained by the study of more complex formulations may be compared.

why how

This approach to the problem is dependent upon the machine used to perform the necessary controlled smoking operation to collect representative samples for analysis. Evans Research and Development Corporation has a machine that will smoke several cigarettes simultaneously under controlled and reproducible conditions. Moreover, the performance of the machine is recorded continuously. It is proposed to construct a large machine based on the principles and design of the present one. This machine, therefore, will insure a constnat supply of representative analytical samples.

research

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The separation of cigarette tobacco smoke into its condensible and non-condensible fractions and the separation of the condensible fraction into its acid, basic, and neutral fractions would be the first step to be undertaken. The individual components of these fractions then would be separated and identified by chemical and physical methods such as spectrophotometry, colorimetry, chromatography, molecular distillation, distribution between immiscible solvents, derivatization, etc.

Sadler Job Note # req'd

In addition to the analytical work on tobacco smoke, and smoke from cigarettes containing known additives, research would also be directed toward the isolation and identification of the components of the tobacco itself. Examination of the data from both studies should give a clue to the chemical and physical phenomena involved in cigarette smoking.

Suchos ?

Wow!

The analytical studies could be supplemented by a program involving the preparation of the known components of tobacco smoke either by isolation or synthesis. The availability of these pure materials would be helpful in working out suitable quantitative analytical procedures. They might also be useful in other laboratories that are studying tissue changes under various conditions.

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6. Budget Plan:

Salaries	$15,750
Expendable Supplies	2,000
Permanent Equipment	2,000
Overhead	9,375
Other (travel)	500
Total	$30,125

30 or 300

7. Anticipated Duration of Work: The budget indicated above is for one year. It is anticipated that a total of three years will be required. An annual budget review is suggested in order to provide for changes in accordance with new developments.

8. Facilities and Staff Available:

Consultant: Dr. Gilbert Stork, Columbia University

Regular Staff: Specialists from among a staff of 40 chemists will be selected and assigned to those portions of the investigation for which they are highly trained. These chemists will be made available to the research program in accordance with the requirements as determined by Dr. Frank D. Pickel, the principal investigator.

Facilities: Well equipped chemical and physical laboratories, including machine shop and other supplemental services, with 17,500 square feet in New York City, and 5,000 square feet in Yonkers, New York.

9. Additional Requirements:

The principal addition to present facilities will be the construction, in the Evans Research and Development Corporation machine shop, of a larger model of the cigarette smoking machine now in use.

10. Additional Information (Including relation of work to other projects and other sources of supply):

Over a period of years the laboratories of Evans Research and Development Corporation have been engaged in several projects concerned with evaluating filters both for cigarette holders and for cigarette tips. They have also been actively engaged in non-conventional chemical analysis; the separation and identification of trace components from such diverse material as pepper, maple syrup, dehydrated foods, hair, prophyrins, natural gums and resins, contaminated air, alcoholic beverages, paper and foods. In the pharmaceutical field, projects dealing with antibiotics, radio opaque materials, hormones, carcinogenic hydrocarbons, enzymes, vesicants, and diuretics have been successfully carried out. Its staff has had many years experience in such fields and is familiar with the techniques which facilitate such work.

The success obtained with nonconventional chemical analysis might be of immediate interest to the Tobacco Industry Research Committee. The term, nonconventional chemical analysis is used here to distinguish it from orginary routine analytical procedures. This kind of analysis should be useful in studying the chemical composition of tobacco and accompanying products.

Signature /s/ Eric J. Hewitt

Director of Project Eric J. Hewitt, Ph.D.
Vice President and Director of Research

/s/ James Lawrie

Business Officer of the Institution

James Lawrie, Secretary-Treasurer

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The investigation of black pepper, undertaken by Evans Research and Development Corporation as a research project for the Office of the Quartermaster General of the United States Army, can be cited as an example of the successful use of nonconventional analysis. Natural pepper was analyzed qualitatively and semi-quantitatively. Domestic materials containing the components of natural pepper were then formulated in such a way as to duplicate the odor and flavor of natural pepper. A synthetic bit principle and a substitute oleorasin (as a fixative) were added to this formulation. The result was a highly satisfactory "synthetic" pepper which is now being field tested by the Army.

Evans Research and Development Corporation is well qualified to study the combustion phases of the cigarette problem because of their extensive experience with solid fuels and explosives.

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